Triple-Play Over Broadband Technologies

Interoperability testing suite for the Triple-Play

Lannion, Brittany, France
12 - 16 May 2008

Registration deadline: April, 2008 21st

The ETSI Plugtests interoperability event

The place to be to assess your solutions to an ever increasing demand for a higher bandwidth

OVERVIEW OF THE EVENT

The broadband access world has been evolving a lot during the last years. From the initial ADSL (Asymetric Digital Subscriber Line) on the now well-known copper pair to the various current fiber based architectures, one has always tried to increase the bandwidth, the number of services and their quality.

In the context where the broadband access infrastructure is shared between several equipments from different manufacturers, the implementation of telecommunication standards is for sure required but moreover, our common last years activity shows that in this complex Multi-Play environment, interoperability tests are inevitable, provide shortcuts to product improvements and represent a great source of experience.

This year, the triple-play part of the Plugtests offers a place and means to reach Residential Gateway (RGW), MultiService Access Nodes (MSAN) and test tool providers' expectations. The technical Triple-Play Services (Internet, Voice over IP (VoIP) and Audiovisual IP TV & Video on Demand components) environment provides again the relevant and significant features that you probably discovered last years : H323 and SIP VoIP was already proposed in 2006, HD TV in 2007. It also keeps track of the recent evolutions in these domains and for instance introduces partly IPv6 in the 2008 edition.

A landmark testing event which offers an unprecedented opportunity to focus on different promising technologies and brings together experts of the domains!

WHAT'S NEW THIS YEAR FOR THE TRIPLE-PLAY PART

• IPv6 tests are introduced in the triple play interoperability testing suite, developed incrementally during past years plugtests events

• Triple play application interoperability (RGW/MSAN) testing over copper pair access technologies

• Triple play application testing over fiber based technologies full system

• Live TV flows
  - Standard Definition and High-Definition TV
  - MPEG4/H264
  - RTP and UDP based
  - With and without FEC protection

• All along the 2008 edition, expertise will focus :

  • on TV over broadband technologies parameters evaluation that will be proposed to vendors by Telecom R&D experts

  • on Voice quality measurements that will be proposed to vendors by France Telecom R&D experts

•A dedicated access infrastructure used as reference for test results throughout the week

• … and still Giga-Ethernet aggregation network technologies and fully equipped triple play positions

WHICH FEATURES MAY BE TESTED ?

DATA	PPPoE or DHCP Radius Authentication Internet Access FTP download / Upload Ethernet or Wifi CPE access - Mainly in IPv4 and for specific scenarios in IPv6
SD and HD Digital TV	Major combinaisons of TV Flows ° MPEG4 HD / SD, ° RTP / UDP, ° Standard / FEC protected HD SetTopBoxes + HD Ready TV screens Multicast Transmission IGMP-v2 Traffic prioritization, shaping Zapping time Expertise on TV&Video QoS Measurements
Voice over IP	SIP and H323 support DECT Phones available Public Analog Lines available Voice Media Gateway SIP Proxy & H323 Gatekeeper Expertise on Voice QoS Measurements

1.1 The scope of the testing suite

The triple-play testing-suite document follows the results of last year collaboration with the FP6 MUSE project. It targets a framework for testing multiservices broadband bundles to test the end-to-end connectivity and the perceived quality of service when delivering voice or digital TV services. The content of this document is to be used as a testing guideline for Multiservice Access Node (MSAN) and Residential Gateway (RGW) vendors who participate to the triple-play part of the ETSI Plugtests 2008.

Triple-Play Applications Interoperability means that the desired communication can be established for all involved OSI layers and protocols by connecting two interfaces directly. This is not obvious when connecting solutions from different vendors.

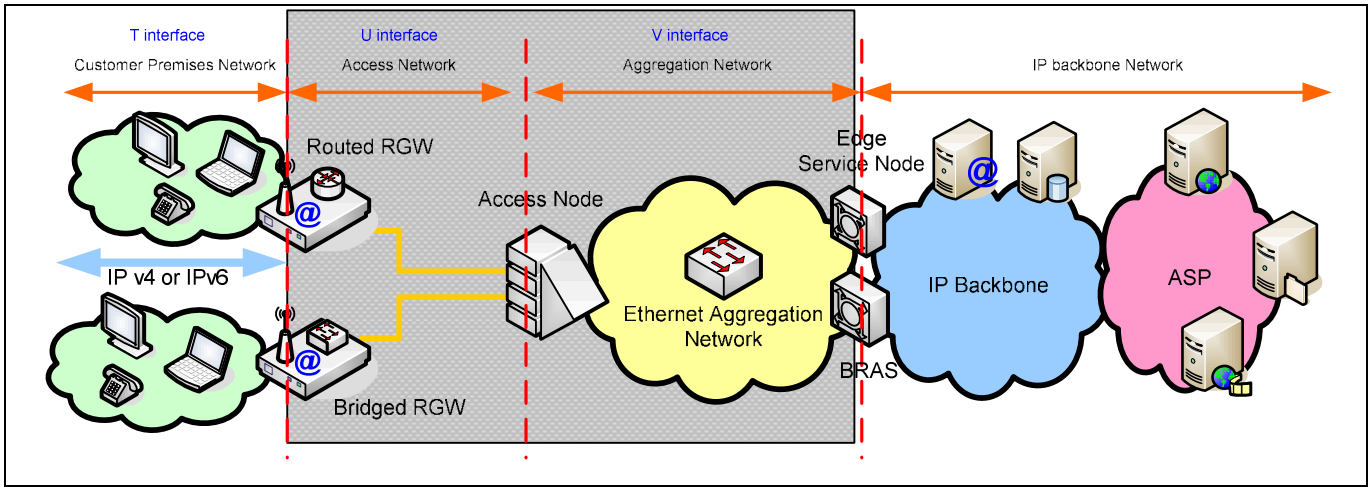


Figure 1**Error! Bookmark not defined.**-1: Multiplay interoperability testing suite scope

The test suite is targeting an environment where a Residential Gateway either routed or bridged, located within the customer premise, is point-to-point connected via a broadband technology to a Multiservice Access Node (MSAN). This node provides some Ethernet interfaces so as to connect the aggregation network which will aggregate the traffic flow towards the IP backbone where the services platforms are situated.

Some Edge nodes located on this aggregation network face the IP network carrying the services to be handled by the triple-play offers. These can be BRAS (Broadband Access Server) or a separate IP service edge node providing connectivity to other applications like VoIP or Broadband TV and Video On Demand.

1.2 Triple-play position description

For executing the triple-play interoperability test suite described hereafter, the following elements will be needed per position:

- 1 end-user PC or Laptop
- 1 High-Definition TV-set
- 1 High-Definition / Standard Definition SAGEM Set-Top-Box
- 1 DECT phone with a Z interface
- 1 phone with a Z interface connected to a public analog phone line
- 1 WiFi Phone (SIP protocol support)
- 1 Personnal Digital Assistant (Wifi or Bluetooth based)

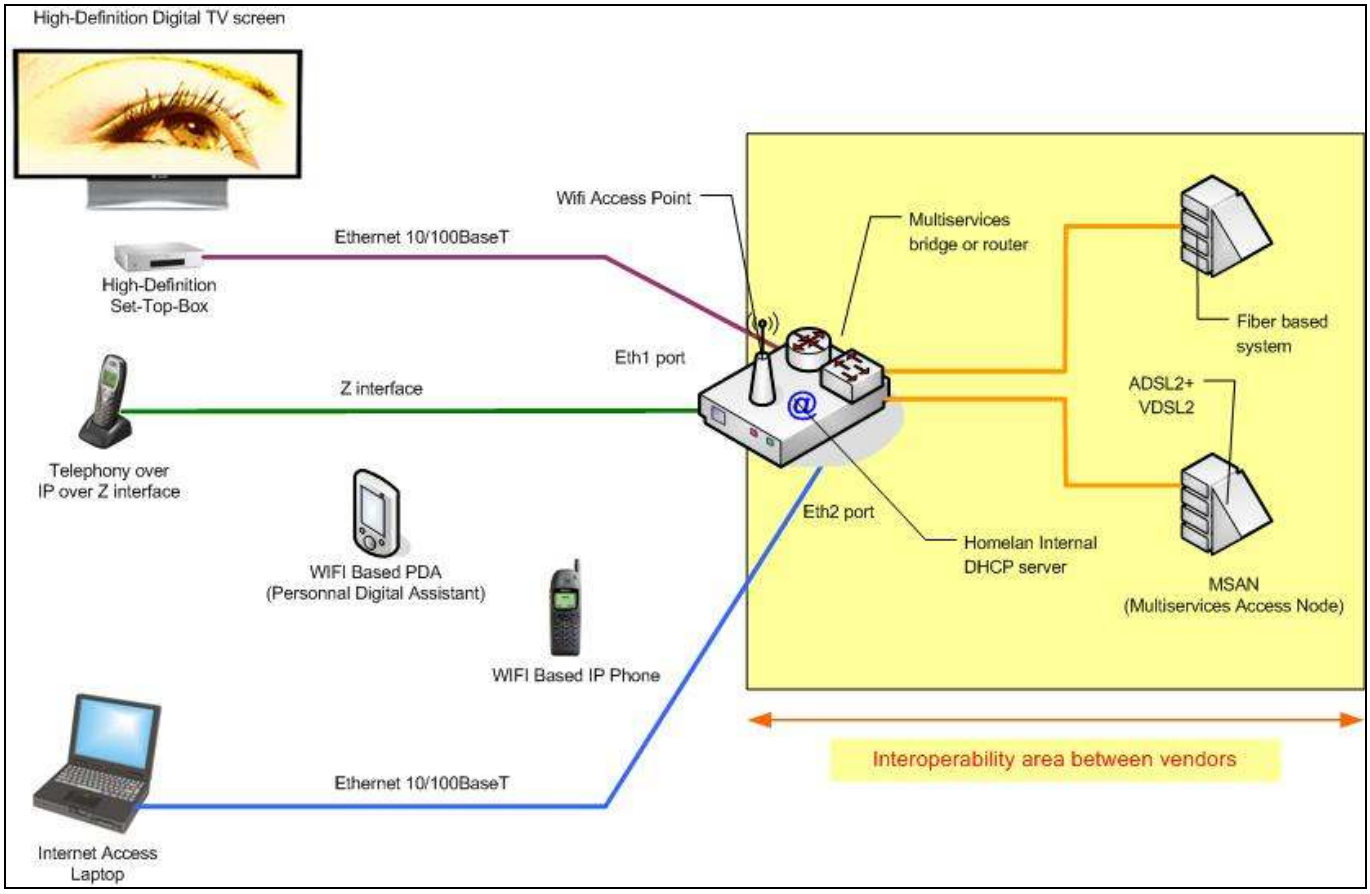


Figure 1-2: Triple-Play Position Description

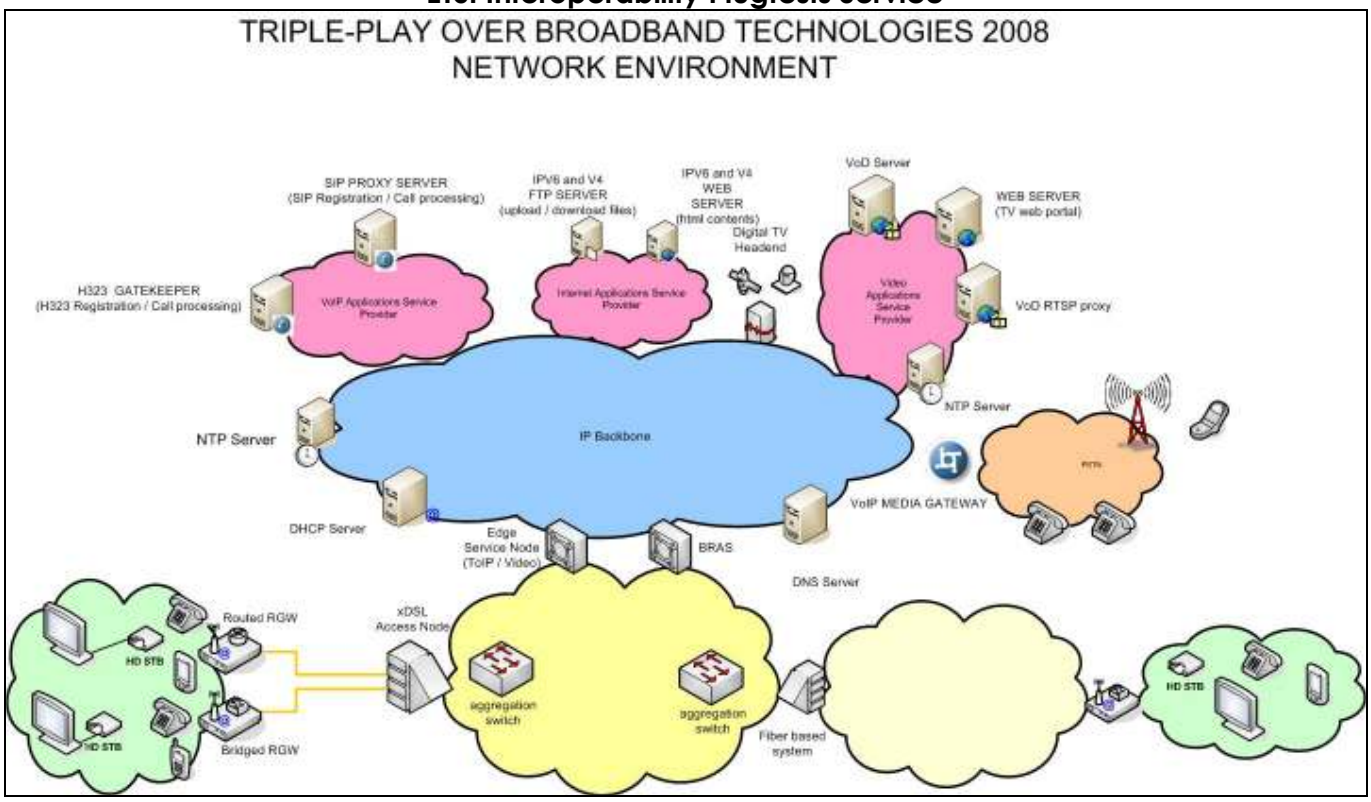
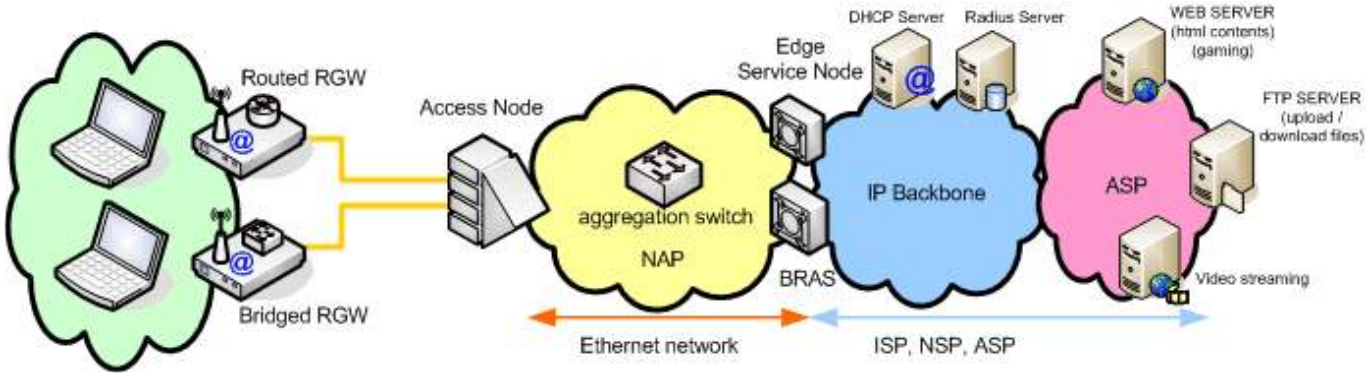


Figure 1-3 : Triple-Play overall testing environment

1.3 High-Speed Internet Access Service testing

1.3.1 Description

The High-Speed Internet Access Service is the best-effort broadband Internet access as we currently know.



1.3.2 PPPoE session functional test

Objective: To be able to access the all set of internet services, verify that the Residential Gateway is able to negotiate a PPPoE session with the BRAS.

1.3.3 PPPoA to PPPoE session functional test

Objective: To be able to access the all set of internet services, verify that the Residential Gateway is able to negotiate a PPPoA session with the DSLAM that will translated the session into PPPoE to reach the BRAS.

1.3.4 IPoE (DHCP) session functional test

Objective: To be able to access the all set of internet services, verify that the Residential Gateway is able to negotiate a DHCP session with the service node.

1.3.5 Data traffic performance test

Objective: To be able to upload and download as much traffic as possible through the session established either using PPPoE or DHCP address allocation. This test will verify that the Residential Gateway is able to cope with the amount of bandwidth offered.

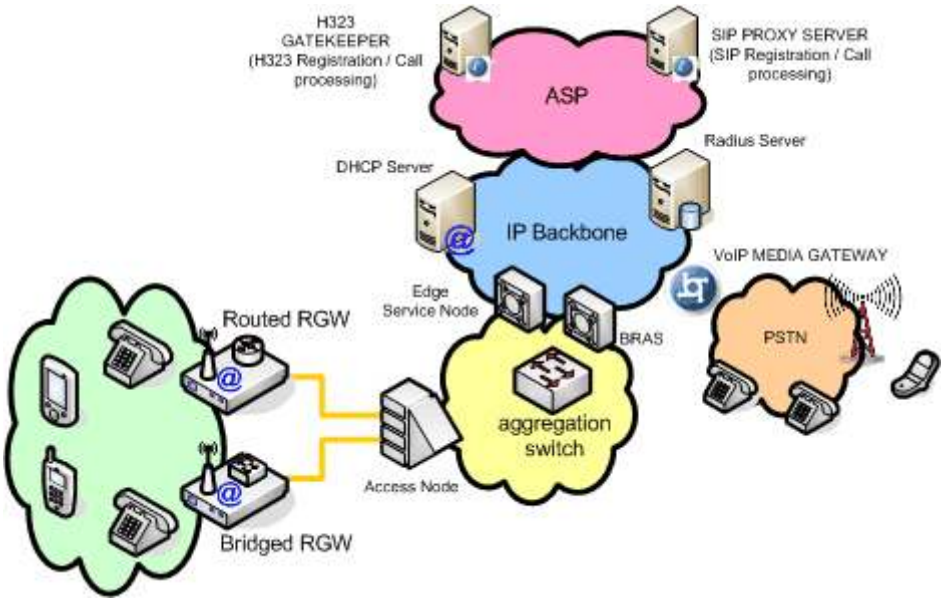
1.3.6 Internet flows through NAT/PAT - Firewall test

Objective: When the architecture contains NAT/PAT features, verify that the NAT/PAT supports the traversal of large amount of internet data flows at the access network/home Network.

1.4 Voice over IP Service testing

1.4.1 Description

Voice Over Internet Protocol (VoIP) is a term used for voice being transported via the internet Protocol regardless whether H.323, SIP or a proprietary standard is used. VoIP defines a way to carry voice calls over an IP network including the digitization and the packetisation of the voice streams. These VoIP services are typically delivered to customers through a broadband access network. The data network involved might be the Internet itself, or a dedicated Virtual Private Network managed on the operator's network.



1.4.2 SIP or H323 registration functional test

Objective: To be able to access the services, verify that a SIP/H323 endpoint or a SIP UA or H323 Softphone can register to the service node.

1.4.3 VoIP services in a SIP or H323 environment

Objective: Verify that a SIP UA can initiate, maintain and tear down a session when calling another SIP UA.

1.4.4 VoIP services interworking testing

Objective: Verify that a SIP UA can initiate, maintain and tear down a session when calling another client in a different access network (PSTN).

1.4.5 VoIP flows through NAT/PAT - Firewall test

Objective: When the architecture contains NAT/PAT features, verify that the NAT/PAT supports the traversal of VoIP flows at the access network/home Network.

1.4.6 VoIP services integrity testing

Objective: Evaluate voice quality of communications establish between a SIP or H323 end point and a PSTN.

1.4.7 DTMF code transmission test

Objective: Verify the correct transmission of DTMF code between a SIP or H323 end point and a PSTN access.

1.4.8 Post-Dialing Delay (PDD) evaluation

Objective: Evaluate the Post-Dialing Delay (PDD) of communications established between a SIP or H323 end point and a PSTN analog phone

From the last tree points, a specific detailed, individual and anonymous report will be given to each participant of the tests.

1.5 Wifi based Voice over IP Service testing

1.5.1 Description

The High-Speed Internet Access Service is the best-effort broadband Internet access as we currently know.

1.5.2 DHCP session functional test

Objective: To be able to access the all set of internet services, verify that the Residential Gateway is able to provide an IP address to a device attached to it through Wifi.

1.5.3 Data traffic performance test

Objective: To be able to upload and download as much traffic as possible through the session established. This test will verify that the Residential Gateway is able to cope with the amount of bandwidth offered when using the Wifi interface.

1.5.4 SIP or H323 registration functional test

Objective: To be able to access the services, verify that a SIP/H323 endpoint or a SIP UA or H323 Softphone attached through Wifi to the residential gateway can register to the service node.

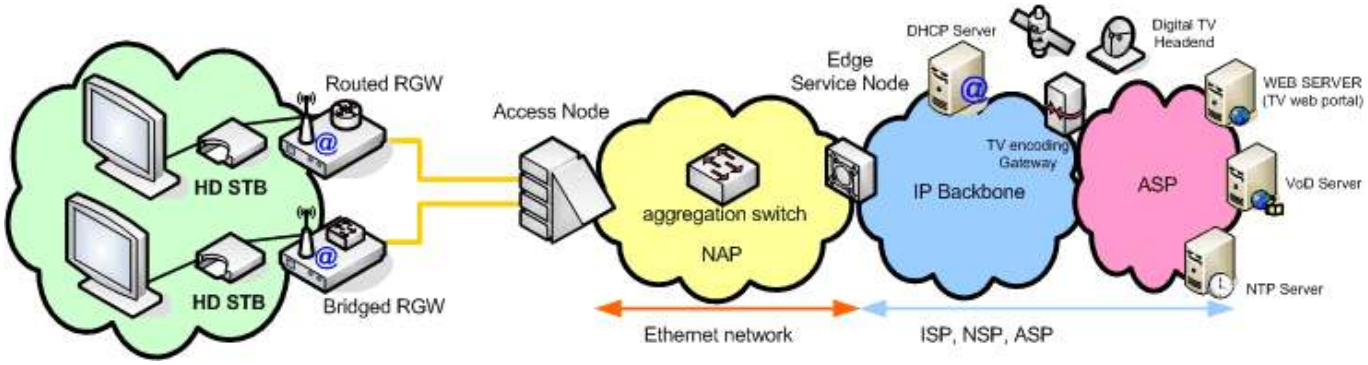
1.5.5 VoIP services in a SIP or H323 environment

Objective: Verify that a SIP UA attached through Wifi to the residential gateway can initiate, maintain and tear down a session when calling another SIP UA.

1.6 Digital Television Service testing

1.6.1 Description

The High-Speed Internet Access Service is the best-effort broadband Internet access as we currently know.



1.6.2 Set-top-Box registration process

Objective: An STB has to be able to boot to reach the TvNUM services platform servers (DHCP, WEB and NTP servers)

1.6.3 Multicast flows availability

Objective: The STB should be able to access all the multicast streams that are sent over the Ip-backbone toward the access node. These multicast flows are joinable through the use of the IGMP protocol

1.6.4 Multicast flows on the MSAN

Objective: To verify that when a customer asks for a channel, this channel multicast flow is not sent on the others xDSL customers connected to the same Access Node

1.6.5 End-user zapping time evaluation

Objective: Once the STB has booted and accessibility to the Video service platform home page has been checked, the customer has to be able to zap between the different broadcasted Tv channels.

1.6.6 Network zapping time evaluation

Objective: Through the mean of test testing tool, verify that zapping between the different broadcasted Tv channels is possible and evaluate the zapping time.

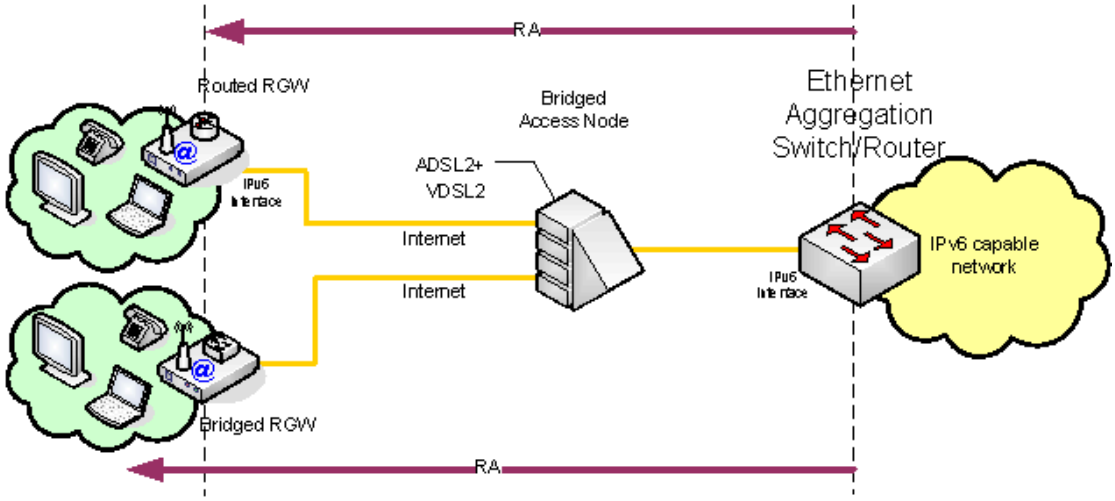
1.6.7 Video flow QOS test

Objective: to evaluate the QOS of Video streams through the RGW.

1.7 IPv6 testing

1.7.1 Description

The introduction of IPv6 into telecom operator networks implies multiple configuration modifications at different levels – core, aggregation and access networks. The following two tests constitute a first and simple proposal for the 2008 plugtests. It implies the correct total handling of IPv6 packets in the CORE network and a partial or no implementation at MSAN level depending on in its configuration mode (none in bridged mode for instance). Depending on participant feedback, this part will be enriched.



1.7.2 IPv6 address autoconfiguration test

Objective: To build an IPv6 address from the RA messages received from the first L3 equipment, and record the parameters from the RA message that may be needed to access the services.

1.7.3 IPv6 Internet browsing

Objective: To perform a DNS request and access an HTTP web page on IPv6 transport.

1.8 Multiplay testing

1.8.1 Data traffic + Voip

Objective: To be able to upload and download as much traffic as possible through the Internet session while passing a voip call using SIP or H323. This test will verify that the residential gateway is able to cope with the amount of bandwidth offered to the internet traffic together with allocating a high-priority treatment to the voip traffic flow .

1.8.2 Data traffic + Live Video

Objective: To be able to upload and download as much traffic as possible through the Internet session while watching a digital TV program. This test will verify that the residential gateway is able to cope with the amount of bandwidth offered to the internet traffic together with allocating sufficient bandwidth and a high-priority treatment to the video traffic flow.

1.8.3 Data traffic + Video On Demand

Objective: To be able to upload and download as much traffic as possible through the Internet session while watching a Video On Demand program. This test will verify that the residential gateway is able to cope with the amount of bandwidth offered to the internet traffic together with allocating sufficient bandwidth and a high-priority treatment to the video On Demand traffic flow.

1.8.4 Data traffic + Voip + Video

Objective: To be able to upload and download as much traffic as possible through the Internet session while passing a voip call using SIP or H323 and watching a live video program. This test will verify that the residential gateway is able to cope with the amount of bandwidth offered to the internet traffic together with allocating sufficient bandwidth and a high-priority treatment to the live video and voip traffic flow.

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